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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/750,437 | 12/30/2003 | Nathan W. Wright | TI-36893 | 1778 |

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EXAMINER

TANG, MINH NHUT

ART UNIT PAPER NUMBER

2829

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/750,437

Applicant(s)

WRIGHT, NATHAN W.

Examiner

Minh N. Tang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/30/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on December 30, 2003 is considered by the examiner.

Specification

2. The abstract of the disclosure is objected to because the form and legal phraseology often used in patent claims, such as "comprise", "means" and "said" should be avoided. Furthermore, the abstract is less than 50 words in length.

Correction is required.

3. The disclosure is objected to because of the following informalities:

a/ on page 7, lines 12 and 20, "13" should be -- 15 --.

b/ on page 8, line 16, "contact surface 42" should be -- contact surface 62 --.

Appropriate correction is required.

4. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claims 1, 3-4, 11, 13 and 22 are objected to because of the following informalities:

a/ in claim 1, since the term "at least one" associated with the term "a plurality" make the claim unclear, therefore "at least one opening" (line 2), "at least one heat sink aligned" (line 5), and "engaging semiconductor devices" (line 6) are interpreted as -- each opening --, -- a plurality of heat sinks each aligned --, and -- engaging respective

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semiconductor devices --, respectively. Furthermore, "the surface" (line 8), and "semiconductor devices" (line 9) should be -- the contact surface --, and -- the respective semiconductor devices --, respectively.

b/ in claims 3 and 13, all in line 2, "the heat sinks" should be -- each of the heat sinks --.

c/ in claim 4, line 2, "the support structures" should be -- support structures --.

d/ in claims 11 and 22, likewise claim 1, "at least one opening" (all in lines 5-6), "at least one heat sink aligned" (all in line 8), and "the semiconductor devices" (all in line 9) should be -- each opening --, -- a plurality of heat sinks each aligned --, and -- each of the semiconductor devices --, respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-8, 10-19, 21-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Currie (U.S.P. 5,162,974).

As to claims 1-2, 11-12 and 22, Currie discloses, in Figs. 1 and 2, a burn-in system for burning-in a plurality of semiconductor devices (18), comprising: a burn-in board (20) including a plurality of sockets (i.e., formed on the board 20 for mounting the semiconductor devices 18, hereinafter sockets) arranged on a surface of the burn-in

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board (20), each socket (socket) receiving a semiconductor device (18); a substantially planar base member (30 associated with end panel 28) substantially removed from the burn-in board (20), the base member (30, 28) including a plurality of openings (32) extending through the base member (30), each opening (32) being arranged through the base member (30, 28) to correspond with each location of the sockets (sockets) on the burn-in board (20); a plurality of heat sinks (10) each aligned with each opening (32), the heat sinks (10) each having a surface (i.e., top surface of heat collector 16 in Fig. 2) for engaging each of the semiconductor devices (18) positioned in the respective sockets (sockets); biasing members (36) connected to the heat sinks (10) and the base member (30, 28) for pressing the surfaces (top surface) of the heat sinks (10) against the semiconductor devices (18) positioned in the respective sockets (sockets); and an attachment means (24, 26) for attaching the base member (30, 28) to the burn-in board (20).

As to claims 3, 5, 13, 16 and 24, Currie discloses in Figs. 1 and 2, each biasing member (36) comprising a spring that exerts a spring force on the heat sinks (10) to provide the heat sinks (10) with a compliant fit to the semiconductor devices (18).

As to claims 4 and 14, Currie discloses in Figs. 1 and 2, each biasing member (36) including a first end connected to the base member (i.e., 28) by support structures and a second end connected to the heat sink (10).

As to claims 6, 17 and 25, Currie discloses in Figs. 1 and 2, each heat sink (10) including a first portion (top portion) and a second portion (side portion), the first portion

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(top portion) defining the contact surface (top surface), the second portion (side portion) including a plurality of upstanding spaced apart heat dissipating fins (14).

As to claims 7, 18 and 26, Currie discloses in Figs. 1 and 2, the openings (32) providing access for at least one of repair, measurement, and visual inspection of the semiconductor devices (18).

As to claims 8, 19 and 27, Currie discloses in Figs. 1 and 2, the attachment means (24, 26) comprising clamp (i.e., when the attachment means 24, 26 mounted to together with the board 20 and the base member 30, 28).

As to claims 10, 21 and 23, Currie discloses in Figs. 1 and 2, at least on stabilization member (12) that substantially inhibits lateral and torsional movement of the heat sinks (10) while allowing longitudinal movement.

As to claim 15, Currie discloses in Figs. 1 and 2, the base member (28) comprising two laterally displaced openings (34) aligned over each socket (socket), each of the two openings (34) being separated by a portion of the base member (28), the portion of the base member (28) separating the two openings (34) defining the support structures.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 9, 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Currie (U.S.P. 5,162,974) in view of Messina et al. (6,778,393).

As to claims 9, 20 and 28, Currie discloses all the limitations recited in the claims but does not explicitly disclose the base member made of metal. Messina et al. disclose, in Fig. 1, a coolant distribution unit (21) comprising plates (31, 32) formed of either a touch material or a thin, flexible, metal such as aluminum, steel, or other metal alloys compatible with the coolant. It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the system of Currie by providing the base member made of metal as taught by Messina et al. so that it would be compatible with the coolant.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Deeney 6,549,418 Land Grid Array Integrated Circuit Device Module.


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| | | |
|------------|-----------|---|
| Loo et al. | 5,648,893 | Upgradable Multi-Chip Module. |
| Lim et al. | 5,528,466 | Assembly For Mounting And Cooling A Plurality Of Integrated Circuit Chips Using Elastomeric Connectors And A Lid. |

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh N. Tang whose telephone number is (571) 272-1971. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramirez can be reached on (571) 272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


MINH NHUT TANG
PRIMARY EXAMINER
01/06/05